

Release notes for ENDF/B Development n-069_Tm_168
evaluation

ENDF
B-VII.dev

April 26, 2017

- **psyche** Warnings:

1. Strength function in URR not in agreement with PSYCHE's expectations
FILE 2 / SECTION 151 / ISOTOPE MASS = 168. L = 0 / STRENGTH FUNCTION IS 9.65973E-05 / STRENGTH FUNCTION 9.65973E-05 / LIES OUTSIDE LIMITS 1.00000E-04 TO 6.00000E-04 (0): URR str. ftn.

```
FILE 2
SECTION 151
ISOTOPE MASS = 168. L = 0
STRENGTH FUNCTION IS 9.65973E-05
STRENGTH FUNCTION 9.65973E-05
... [1 more lines]
```

2. Non-threshold reaction with Q value differing from PSYCHE's expectations
FILE 3 / SECTION 22 / THE CALCULATED Q 9.91936E+05 DISSAGREES WITH THE GIVEN Q 1.24500E+06 (0): Iffy Q

```
FILE 3
SECTION 22
THE CALCULATED Q 9.91936E+05 DISSAGREES WITH THE GIVEN Q 1.24500E+06
```

- **recent** Warnings:

1. Statistical weight of certain L values were incorrect
0: RRR goof (a)

```
Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
=====
Retrieval Criteria----- MAT
File 2 Minimum Cross Section- 1.0000E-10 (Standard Option)
Reactions with No Background- Output (Resonance Contribution)
... [200 more lines]
```

- **fudge-4.0** Warnings:

1. Missing a channel with a particular angular momenta combination
resonances / resolved (Error # 1): missingResonanceChannel

```
WARNING: Missing a channel with angular momenta combination L = 0, J = 1.5 and S = 1.5 for "capture"
WARNING: Missing a channel with angular momenta combination L = 0, J = 3.5 and S = 3.5 for "capture"
```

2. Potential scattering hasn't converted, you need more L's!
resonances / resolved (Error # 2): potentialScatteringNotConverged

```
WARNING: Potential scattering hasn't converged by L=0 at E=3.2 eV, xs[0]/xs[0]=100.0% > 0.1%
```

3. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 2.25%
```

4. Cross section does not match sum of linked reaction cross sections
crossSectionSum label 1: (z,n) (Error # 0): CS Sum.

WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 13.92%

• fudge-4.0 Errors:

1. The spin statistical weights are off, indicating missing channels
resonances / resolved / MultiLevel_BreitWigner (Error # 0): badSpinStatisticalWeights

WARNING: The spin statical weights for L=0 sums to 0.428571428571, but should sum to 1.0. You have too few chan

2. Calculated and tabulated Q values disagree.
reaction label 37: n[multiplicity:'2'] + Tm167 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -6406244.44934082 eV vs -6.8404e6 eV!

3. Energy range of data set does not match cross section range
reaction label 37: n[multiplicity:'2'] + Tm167 + gamma / Product: n / Distribution: / energyAngular - XYs3d: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6881080.0 -> 30000000.0) vs (6881486.0 -> 30000000.0)

4. Energy range of data set does not match cross section range
reaction label 37: n[multiplicity:'2'] + Tm167 + gamma / Product: gamma / Multiplicity: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6881080.0 -> 30000000.0) vs (6881486.0 -> 30000000.0)

5. Energy range of data set does not match cross section range
reaction label 37: n[multiplicity:'2'] + Tm167 + gamma / Product: gamma / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6881080.0 -> 30000000.0) vs (6881486.0 -> 30000000.0)

6. Energy range of data set does not match cross section range
reaction label 37: n[multiplicity:'2'] + Tm167 + gamma / Product: gamma / uncorrelated - energy - XYs2d: (Error # 0): Domain mismatch (a)

WARNING: Domain doesn't match the cross section domain: (6881080.0 -> 30000000.0) vs (6881486.0 -> 30000000.0)

7. Calculated and tabulated Q values disagree.
reaction label 38: n[multiplicity:'3'] + Tm166 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -15131944.83026123 eV vs -1.5567e7 eV!

8. Calculated and tabulated Q values disagree.
reaction label 39: n[multiplicity:'4'] + Tm165 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -22161256.69052124 eV vs -2.2594e7 eV!

9. Calculated and tabulated Q values disagree.
reaction label 40: n + H1 + Er167 + gamma (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -4875027.149932861 eV vs -3.086e6 eV!

10. Calculated and tabulated Q values disagree.
reaction label 41: H1 + Er168 (Error # 0): Q mismatch

- WARNING: Calculated and tabulated Q-values disagree: 2896288.649261475 eV vs 2.461e6 eV!
11. Calculated and tabulated Q values disagree.
reaction label 42: H1 + Er168_e1 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 2816488.649261475 eV vs 2.3812e6 eV!

 12. Calculated and tabulated Q values disagree.
reaction label 43: H1 + Er168_e2 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 2632198.649261475 eV vs 2196910. eV!

 13. Calculated and tabulated Q values disagree.
reaction label 44: H1 + Er168_e3 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 2347538.649261475 eV vs 1912250. eV!

 14. Calculated and tabulated Q values disagree.
reaction label 45: H1 + Er168_e4 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 2075118.649261475 eV vs 1639830. eV!

 15. Calculated and tabulated Q values disagree.
reaction label 46: H1 + Er168_e5 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 2000488.649261475 eV vs 1.5652e6 eV!

 16. Calculated and tabulated Q values disagree.
reaction label 47: H1 + Er168_e6 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 1967978.649261475 eV vs 1532690. eV!

 17. Calculated and tabulated Q values disagree.
reaction label 48: H1 + Er168_e7 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 1901538.649261475 eV vs 1466250. eV!

 18. Calculated and tabulated Q values disagree.
reaction label 49: H1 + Er168_e8 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 1802248.649261475 eV vs 1366960. eV!

 19. Calculated and tabulated Q values disagree.
reaction label 50: H1 + Er168_e9 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 1778718.649261475 eV vs 1343430. eV!

 20. Calculated and tabulated Q values disagree.
reaction label 51: H1 + Er168_e10 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 1703258.649261475 eV vs 1267970. eV!

 21. Calculated and tabulated Q values disagree.
reaction label 52: H1 + Er168_e11 (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: 1679128.649261475 eV vs 1243840. eV!

22. Calculated and tabulated Q values disagree.
reaction label 53: H1 + Er168_e12 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1632378.649261475 eV vs 1197090. eV!
23. Calculated and tabulated Q values disagree.
reaction label 54: H1 + Er168_e13 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1630218.649261475 eV vs 1194930. eV!
24. Calculated and tabulated Q values disagree.
reaction label 55: H1 + Er168_e14 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1620018.649261475 eV vs 1184730. eV!
25. Calculated and tabulated Q values disagree.
reaction label 56: H1 + Er168_e15 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1584828.649261475 eV vs 1149540. eV!
26. Calculated and tabulated Q values disagree.
reaction label 57: H1 + Er168_e16 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1537388.649261475 eV vs 1.1021e6 eV!
27. Calculated and tabulated Q values disagree.
reaction label 58: H1 + Er168_e17 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1499458.649261475 eV vs 1064170. eV!
28. Calculated and tabulated Q values disagree.
reaction label 59: H1 + Er168_e18 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1492548.649261475 eV vs 1057260. eV!
29. Calculated and tabulated Q values disagree.
reaction label 60: H1 + Er168_e19 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1485188.649261475 eV vs 1.0499e6 eV!
30. Calculated and tabulated Q values disagree.
reaction label 61: H1 + Er168_e20 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1474188.649261475 eV vs 1.0389e6 eV!
31. Calculated and tabulated Q values disagree.
reaction label 62: H1 + Er168_e21 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1464818.649261475 eV vs 1029530. eV!
32. Calculated and tabulated Q values disagree.
reaction label 63: H1 + Er168_e22 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1463338.649261475 eV vs 1028050. eV!

33. Calculated and tabulated Q values disagree.
reaction label 64: H1 + Er168_e23 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1447328.649261475 eV vs 1012040. eV!
34. Calculated and tabulated Q values disagree.
reaction label 65: H1 + Er168_e24 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1403148.649261475 eV vs 967860. eV!
35. Calculated and tabulated Q values disagree.
reaction label 66: H1 + Er168_e25 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1354728.649261475 eV vs 919440. eV!
36. Calculated and tabulated Q values disagree.
reaction label 67: H1 + Er168_e26 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1354578.649261475 eV vs 919290. eV!
37. Calculated and tabulated Q values disagree.
reaction label 68: H1 + Er168_e27 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1326838.649261475 eV vs 891550. eV!
38. Calculated and tabulated Q values disagree.
reaction label 69: H1 + Er168_e28 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1322168.649261475 eV vs 886880. eV!
39. Calculated and tabulated Q values disagree.
reaction label 70: H1 + Er168_e29 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1290438.649261475 eV vs 855150. eV!
40. Calculated and tabulated Q values disagree.
reaction label 71: H1 + Er168_e30 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1280948.649261475 eV vs 845660. eV!
41. Calculated and tabulated Q values disagree.
reaction label 72: H1 + Er168_e31 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1279478.649261475 eV vs 844190. eV!
42. Calculated and tabulated Q values disagree.
reaction label 73: H1 + Er168_e32 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1271778.649261475 eV vs 836490. eV!
43. Calculated and tabulated Q values disagree.
reaction label 74: H1 + Er168_e33 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1262828.649261475 eV vs 827540. eV!

44. Calculated and tabulated Q values disagree.
reaction label 75: $H1 + Er168_e34$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1242738.649261475 eV vs 807450. eV!
45. Calculated and tabulated Q values disagree.
reaction label 76: $H1 + Er168_e35$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1240018.649261475 eV vs 804730. eV!
46. Calculated and tabulated Q values disagree.
reaction label 77: $H1 + Er168_e36$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1188298.649261475 eV vs 753010. eV!
47. Calculated and tabulated Q values disagree.
reaction label 78: $H1 + Er168_e37$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1177108.649261475 eV vs 741820. eV!
48. Calculated and tabulated Q values disagree.
reaction label 79: $H1 + Er168_e38$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1159598.649261475 eV vs 724310. eV!
49. Calculated and tabulated Q values disagree.
reaction label 80: $H1 + Er168_e39$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1135528.649261475 eV vs 700240. eV!
50. Calculated and tabulated Q values disagree.
reaction label 81: $H1 + (Er168_c \rightarrow Er168 + \gamma)$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1135528.649261475 eV vs 700240. eV!
51. Calculated and tabulated Q values disagree.
reaction label 82: $He4 + Ho165$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9668973.872924805 eV vs 9.233e6 eV!
52. Calculated and tabulated Q values disagree.
reaction label 83: $He4 + Ho165_e1$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9574273.872924805 eV vs 9.1383e6 eV!
53. Calculated and tabulated Q values disagree.
reaction label 84: $He4 + Ho165_e2$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9459173.872924805 eV vs 9.0232e6 eV!
54. Calculated and tabulated Q values disagree.
reaction label 85: $He4 + Ho165_e3$ (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9436973.872924805 eV vs 9.001e6 eV!

55. Calculated and tabulated Q values disagree.
reaction label 86: He4 + Ho165-e4 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9323973.872924805 eV vs 8.888e6 eV!
56. Calculated and tabulated Q values disagree.
reaction label 87: He4 + Ho165-e5 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9307293.872924805 eV vs 8871320. eV!
57. Calculated and tabulated Q values disagree.
reaction label 88: He4 + Ho165-e6 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9249433.872924805 eV vs 8813460. eV!
58. Calculated and tabulated Q values disagree.
reaction label 89: He4 + Ho165-e7 (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9239583.872924805 eV vs 8803610. eV!
59. Calculated and tabulated Q values disagree.
reaction label 90: He4 + (Ho165-c ->Ho165 + gamma) (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 9239583.872924805 eV vs 8803610. eV!
60. Calculated and tabulated Q values disagree.
reaction label 91: Tm169 + gamma (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 8468042.033355713 eV vs 8.0324e6 eV!
61. Calculated and tabulated Q values disagree.
reaction label 92: n + He4 + Ho164 + gamma (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 1680152.350738525 eV vs 1.245e6 eV!
62. Calculated and tabulated Q values disagree.
reaction label 93: n + He3 + Ho165 + gamma (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: -10907512.26528931 eV vs 9.233e6 eV!
63. Calculated and tabulated Q values disagree.
reaction label 94: n + H1[multiplicity:'2'] + Ho166 + gamma (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: -12383383.67105103 eV vs -5.1e6 eV!
64. Calculated and tabulated Q values disagree.
reaction label 95: H1 + H2 + Ho166 + gamma (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: -10163190.66833496 eV vs -5.1e6 eV!
65. Calculated and tabulated Q values disagree.
reaction label 96: H1 + He4 + Dy164 + gamma (Error # 0): Q mismatch
- WARNING: Calculated and tabulated Q-values disagree: 3449173.559875488 eV vs 3.014e6 eV!

66. Calculated and tabulated Q values disagree.
reaction label 97: H2 + (Er167.s ->Er167 + gamma) (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -2654834.147247314 eV vs -3.086e6 eV!

67. Calculated and tabulated Q values disagree.
reaction label 98: He3 + (Ho166.s ->Ho166 + gamma) (Error # 0): Q mismatch

WARNING: Calculated and tabulated Q-values disagree: -4663871.853485107 eV vs -5.1e6 eV!

• njoy2012 Warnings:

1. Evaluation has no unresolved resonance parameters given
unresr...calculation of unresolved resonance cross sections (0): No URR

---message from unresr---mat 6922 has no unresolved parameters
copy as is to nout

2. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (0): HEATR/hinit (4)

---message from hinit---mf6, mt 16 does not give recoil za= 69167
one-particle recoil approx. used.

3. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (1): HEATR/hinit (4)

---message from hinit---mf6, mt 17 does not give recoil za= 69166
one-particle recoil approx. used.

4. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (2): HEATR/hinit (4)

---message from hinit---mf6, mt 22 does not give recoil za= 67164
one-particle recoil approx. used.

5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (3): HEATR/hinit (4)

---message from hinit---mf6, mt 28 does not give recoil za= 68167
one-particle recoil approx. used.

6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)

---message from hinit---mf6, mt 34 does not give recoil za= 67165
one-particle recoil approx. used.

7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)

---message from hinit---mf6, mt 37 does not give recoil za= 69165
one-particle recoil approx. used.

8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)

- message from hinit---mf6, mt 44 does not give recoil za= 67166
one-particle recoil approx. used.
9. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)
- message from hinit---mf6, mt 91 does not give recoil za= 69168
one-particle recoil approx. used.
10. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (8): HEATR/hinit (4)
- message from hinit---mf6, mt102 does not give recoil za= 69169
photon momentum recoil used.
11. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (9): HEATR/hinit (4)
- message from hinit---mf6, mt104 does not give recoil za= 68167
one-particle recoil approx. used.
12. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (10): HEATR/hinit (4)
- message from hinit---mf6, mt106 does not give recoil za= 67166
one-particle recoil approx. used.
13. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (11): HEATR/hinit (4)
- message from hinit---mf6, mt112 does not give recoil za= 66164
one-particle recoil approx. used.
14. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (12): HEATR/hinit (4)
- message from hinit---mf6, mt115 does not give recoil za= 67166
one-particle recoil approx. used.
15. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (13): HEATR/hinit (4)
- message from hinit---mf6, mt649 does not give recoil za= 68168
one-particle recoil approx. used.
16. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (14): HEATR/hinit (4)
- message from hinit---mf6, mt849 does not give recoil za= 67165
one-particle recoil approx. used.
17. Evaluation has no unresolved resonance parameters given
purrr...probabalistic unresolved calculation (0): No URR
- message from purrr---mat 6922 has no unresolved parameters
copy as is to nout

- `acelst` Warnings:

1. The incident energy grid is not monotonic for this angular distribution
0: Bad Ang. Dist.

```

ACELST WARNING - Processing Ang.Dist.MT          2
                  E-grid non-monotonic  1.900000000E+01 1.900000000E+01

```